



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

11201 Renner Boulevard
Lenexa, Kansas 66219

JUL 18 2017

Mr. John Mitchell
Director, Division of Environment
Kansas Department of Health and Environment
1000 S.W. Jackson Street, Suite 540
Topeka, Kansas 66612-1368

Dear Mr. Mitchell:

The U. S. Environmental Protection Agency has completed its review of the revisions to Kansas Water Quality Standards K.A.R. 28-16-28b through K.A.R. 28-16-28f, adopted by the Secretary of Health and Environment on February 12, 2015. The EPA also reviewed the Kansas Implementation Procedures, which are rule referenced in the state's regulations. The Kansas Department of Health and Environment sent revisions to the EPA for review, as required under the Code of Federal Regulations at 40 CFR §131.20, on March 27, 2015.

As part of the review process, the KDHE made the final draft revisions available for public review and comment, starting on September 11, 2014, and ending on November 20, 2014. A public hearing was held at the Curtis State Office Building on November 20, 2014. The availability of the revisions was announced in the Kansas Register (Volume 33, Number 37 on September 11, 2014). The Office of the State Attorney General certified the revised WQS on February 3, 2015; the new or revised WQS were formally adopted by the KDHE on February 12, 2015. The final regulations were published in the March 5, 2015, Kansas Register. The WQS regulations became effective under state law on March 20, 2015.

Under Section 303(c) of the Clean Water Act, 33 U.S.C. § 1313(c), states are to hold public hearings for the purpose of reviewing applicable WQS no less than once every three years, and to submit any revised or new standards to the EPA for review and approval. Federal regulations at 40 CFR §§ 131.20, 131.21, and 131.22 implement these requirements. Based on our review, Kansas' public participation process is consistent with, and satisfies, the procedural requirements of 40 CFR § 131.20.

Under Section 303(c) of the CWA, the EPA is required to review and approve or disapprove new or revised WQS adopted by the state. This review involves a determination of whether:

- The state has adopted designated uses consistent with the requirements of the CWA;
- The state has adopted criteria that protect the designated water uses;
- The state has followed its legal procedures for revising or adopting standards;
- The state standards that do not include the uses specified in Section 101(a)(2) of the CWA are based upon appropriate technical and scientific data and analyses; and
- The state submission meets the requirements included in 40 CFR § 131.6.



The EPA initiated consultation with the U. S. Fish and Wildlife Service under Section 7(a)(2) of the Endangered Species Act on July 10, 2015, for items EPA is approving. Section 7(a)(2) requires that federal agencies, in consultation with the USFWS, ensure that their actions are not likely to jeopardize the existence of federally listed species or result in the adverse modification of designated critical habitat of such species; this consultation was completed on September 22, 2015.

As Director of the Water, Wetlands and Pesticides Division, I am charged with the responsibility of approving or disapproving new or revised state WQS under Section 303(c) of the CWA. With this letter and enclosure, the EPA is approving four areas of new or revised WQS submitted by the KDHE. The EPA is taking no action on the remaining provisions. In addition, the EPA is acknowledging the State's deletion of language disapproved by the EPA in 2005. The Enclosure to this letter provides a more detailed description of the EPA's rationale for these actions.

SECTION I: ITEMS THE EPA IS APPROVING

A.	Kansas Water Quality Standards Regulations: Definitions K.A.R. 28-16-28b.
B.	Kansas Water Quality Standards Regulations: General Provisions K.A.R. 28-16-28c. 28-16-28c(b)(2), 28-16-28c(b)(5)
C.	Kansas Water Quality Standards Regulations: Surface water classification and use designation K.A.R. 28-16-28d.
D.	Kansas Water Quality Standards: Tables of Numeric Criteria (January 21, 2015): Table 1a. Aquatic Life, Agriculture, and Public Health Designated Uses Numeric Criteria.

SECTION II: ITEMS ON WHICH THE EPA IS TAKING NO ACTION

A.	Kansas Water Quality Standards Regulations: Definitions K.A.R. 28-16-28b. Point Source Definition.
B.	Kansas Water Quality Standards Regulations (K.A.R. 28-16-28b, 28-16-28c, 28-16-28d, 28-16-28e, 28-16-28f): Non-Substantive Edits.
C.	Kansas Water Quality Standards Regulations: Variances K.A.R. 28-16-28f(d).
D.	Kansas Water Quality Standards: Tables of Numeric Criteria (January 21, 2015) Non-Substantive Edits.
E.	Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1h. Natural Background Concentrations.
F.	Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1g. Temperature, Dissolved Oxygen, and pH Numeric Aquatic Life Criteria. Footnote 2 addressing Dissolved Oxygen.

G.	Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1g. Temperature, Dissolved Oxygen, and pH Numeric Aquatic Life Criteria. Footnote 3 addressing Dissolved Oxygen in lakes or reservoirs.
H.	Kansas Implementation Procedures, Surface Water Quality Standards (October 1, 2012): Section III. Criteria, C. Naturally Occurring Conditions for Low Dissolved Oxygen (DO) Criterion in Streams.
I.	Kansas Implementation Procedures, Surface Water Quality Standards (October 1, 2012): Page 10; D. Duration and Frequency Effective Frequency and Durations of Criteria Digressions for Indicating Impairment by Pollutants* ¹
J.	Kansas Water Quality Standards Regulations: Application of criteria for designated uses of surface waters K.A.R. 28-16-28e(c)(3).
K.	Kansas Surface Water Quality Standards (February 18, 2015); Page 37: 28-16-28e(d)(3)(C): (C) Any substance derived from an artificial source that, alone or in combination with other synthetic or naturally-occurring substances, causes toxic, carcinogenic, teratogenic, or mutagenic effects in humans shall be limited to nonharmful concentrations in surface waters. Unless site-specific water quality conditions warrant the promulgation of more protective criteria under the provisions of subsection (a) of this regulation and K.A.R. 28-16-28f(f), maximum contaminant levels for toxic, carcinogenic, teratogenic, or mutagenic substances promulgated by the United States environmental protection agency pursuant to specified in 40 C.F.R. 141.11 through 141.16, 141.13, and 40 C.F.R. 141.60 141.61 through 141.66, dated July 1, 2003 and adopted by reference in K.A.R. 28-16-28b(hh) 2012, shall be deemed nonharmful. by the department and adopted as domestic water supply criteria.
L.	Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1a. Aquatic Life, Agriculture, and Public Health Designated Uses Numeric Criteria. Five new or revised water quality criteria for pollutants: Mercury, 1,2-dichloropropane, 1,2,4-trichlorobenzene, barium, and endrin.

SECTION III: STATE DELETION OF PREVIOUS EPA DISAPPROVAL

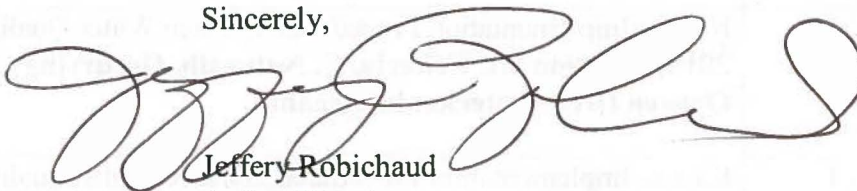
A.	Kansas Water Quality Standards Regulations: General Provisions – K.A.R. 28-16-28c. 28-16-28(c)(2)
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The EPA commends the state's commitment to protecting its waters by establishing WQS and adopting numeric criteria that significantly increase environmental protection to aquatic life and human health for waters of the U.S. located in Kansas. We look forward to continuing to work with the KDHE to update

¹ * For the purposes of assessment under Section 303(d) of the Clean Water Act, this table displays the thresholds of frequency for pollutant concentrations that exceed numeric criteria within the Surface Water Quality Standards to indicate impairment of the designated uses assigned to waters of the state. Typical ambient sampling implies duration of one hour for acute criteria, 4 days for chronic criteria at stable flow and 70 years for water supply or food procurement as a lifetime average.

its WQS through the triennial review process. If you have any questions regarding this matter, please contact John DeLashmit, Chief, Water Quality Management Branch, at (913) 551-7821. The staff contact regarding this letter is Angela Sena; she may be reached at (913) 551-7989.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Jeffery Robichaud', with a large, stylized flourish at the end.

Jeffery Robichaud
Acting Director
Water, Wetlands and Pesticides Division

Enclosure

cc: Corey Buffo, EPA HQ
Trevor Flynn, KDHE
Julia Young, KDHE
John Miesner, USFWS

ENCLOSURE

EPA REGION 7 REVIEW OF KANSAS' 2015 TRIENNIAL REVIEW RULE REVISIONS TO KANSAS' WATER QUALITY STANDARDS

The Kansas Department of Health and Environment (KDHE) sent revisions to Kansas' Water Quality Standards (WQS) Kansas' code of State regulations (K.A.R. 28-16-28b, 28-16-28c, 28-16-28d, 28-16-28e, 28-16-28f, 28-16-58), implementation procedures¹ and tables of numeric criteria to the EPA for review, as required by the Clean Water Act, Section 303(c), and its implementing regulations at 40 CFR § 131.20, on March 27, 2015.

As part of the review process, the KDHE made the final draft revisions available for public review and comment starting on September 11, 2014, and ending on November 20, 2014. A public hearing was held at the Curtis State Office Building on November 20, 2014. The availability of the revisions was announced in the Kansas Register (Volume 33, Number 37 on September 11, 2014). The Office of the State Attorney General certified the revised WQS on February 3, 2015; the new or revised WQS were formally adopted by the KDHE on February 12, 2015. The final regulations were published in the March 5, 2015 Kansas Register. The WQS regulations became effective under state law on March 20, 2015.

Under Section 303(c) of the Clean Water Act (CWA), 33 U.S.C. § 1313(c), states are to hold public hearings for the purpose of reviewing applicable WQS no less than once every three years, and to submit any revised or new standards to the EPA for review and approval. Federal regulations at 40 CFR §§ 131.20, 131.21, and 131.22 implement these requirements. Based on our review, Kansas' public participation process is consistent with, and satisfies, the procedural requirements of 40 CFR § 131.20.

Under Section 303(c) of the CWA, the EPA is required to review and approve or disapprove new or revised WQS adopted by the state. This review involves a determination of whether:

- The state has adopted designated uses consistent with the requirements of the CWA;
- The state has adopted criteria that protect the designated water uses;
- The state has followed its legal procedures for revising or adopting standards;
- The state standards that do not include the uses specified in Section 101(a)(2) of the CWA are based upon appropriate technical and scientific data and analyses; and
- The state submission meets the requirements included in 40 CFR § 131.6.

¹ Kansas Implementation Procedures, Surface Water Quality Standards dated October 1, 2012; while the state made revisions to this document as part of their triennial review, the date of the document was not updated to reflect these revisions.

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SECTION III: STATE DELETION OF PREVIOUS EPA DISAPPROVAL

A.	Kansas Water Quality Standards Regulations: General Provisions – K.A.R. 28-16-28c. 28-16-28(c)(2)
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For the remainder of this Enclosure, the Kansas WQS regulations presented with underlined text represent new or revised state WQS provisions; strike-out text denotes language removed from the state WQS.

SECTION I: ITEMS THE EPA IS APPROVING

A. Kansas Water Quality Standards Regulations: Definitions – K.A.R. 28-16-28b

Revisions include new or revised definitions in K.A.R. 28-16-28b, and the removal of one definition.

(u) [new provision] “Digression” means an actual ambient concentration of a pollutant that does not meet the numeric criteria value for that pollutant.

(w) [new provision] “Discharge design flow” means either of the following:

(1) The anticipated wastewater flow for the next permit cycle determined by the department for an industrial wastewater facility, as defined in K.A.R. 28-16-56c; or

(2) the wastewater treatment capacity of a facility approved by the secretary for other wastewater treatment facilities or systems.

(x) [new provision] “Duration of digression” means the period of time over which pollutant concentrations can be averaged, including the time span during which aquatic life can be exposed to elevated levels of pollutants without harm.

(aa) [new provision] “EPA” means United States environmental protection agency [sic].

(dd) [new provision] “Excursion from numeric criteria value” means the digression of a pollutant exceeding its numeric criteria value beyond the designated duration of digression.

(aa) “Fecal coliform bacteria” means facultatively anaerobic, gram negative, non spore forming, rod shaped bacteria that, when cultured under specific laboratory conditions, will ferment lactose, thereby producing acid, gas, or both.

(gg) [new provision] “Frequency of digression” means the number of times that an excursion from numeric criteria value can occur over time without impairing the designated uses of the water.

(uu) [new provision] “Numeric criteria value” means any of the values listed in tables 1a, 1b, 1c, 1d, 1e, 1g, 1h, 1i, 1j, and 1k of the “Kansas surface water quality standards: tables of numeric criteria.”

(lll) [revised – previously, (fff)]. “Surface waters” means the following: . . . (3) wetlands, including water bodies meeting the technical definition for jurisdictional wetlands given in the “corps of engineers wetland delineation manual,” as published in January 1987 swamps, marshes, bogs and similar areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

(ooo) [new provision] “Thirty-day, ten-year flow” and “30Q10 flow” mean the 30-day average low flow having recurrence of once in 10 years, as statistically determined from historical flow data. Where used in this regulation in context of mixing zones, these terms shall refer to the minimum amount of streamflow occurring immediately upstream of a wastewater discharge and available, in whole or in part, for dilution or assimilation of wastewater discharges.

The Kansas WQS previously defined water quality criteria by the magnitude of the acceptable concentration. The definitions above for “Digression,” “Duration of digression,” and “Excursion from numeric criteria value” refer to the duration and frequency of criteria and will be used by the state when assessing the state’s waters under Section 303(d) of the CWA. The EPA also approves the removal of the fecal coliform definition because Kansas now uses numeric criteria for the indicator organism *E. coli* to protect its recreational waters.

The KDHE also made a change to the definition of surface waters in K.A.R. 28-16-28b(lll)(3) regarding wetlands. In its November 19, 2014, comment letter, the EPA recommended that with regard to the proposed KDHE revisions to the definition of “wetlands” the KDHE consider retaining the frequency and duration language that refers to the technical definition for jurisdictional wetlands in the 1987 U.S. Army Corps of Engineer’s *Wetland Delineation Manual*.

As a result of the EPA's comments, the KDHE added language to the definition of wetlands from the manual to address the EPA's concerns. The Kansas Department of Administration approved this revision on January 20, 2015, and the Attorney General certified this revision on February 3, 2015.

The KDHE also added a definition for "numeric criteria value" that refers to the Kansas surface water quality standards tables of numeric criteria. The EPA reviewed changes to the tables separately. The EPA's approval of the new definition for numeric criteria value is separate from the EPA's review and action on the specific numeric criteria set forth in those tables, as described in Sections I.D. and II, below.

These definitions were added, revised or deleted to clarify the meaning or to update the reference of applicable guidance or regulations within the state water quality standards. Pursuant to Section 303(c) of the CWA, the EPA is approving these revisions as consistent with the CWA and its implementing regulations.

B. General Provisions – K.A.R. 28-16-28c

a. The KDHE revised **28-16-28c(b)(2)** as follows:

(2) Discharges into classified ~~streams~~ stream segments. No mixing zone within a classified stream segment, as defined in K.S.A. 2013 Supp. 82a-2001 and amendments thereto, shall extend beyond the middle of the nearest downstream current crossover point, where the main current flows from one bank to the opposite bank, or more than 300 meters downstream from the point of effluent discharge.

The KDHE added the text "stream segments" to be consistent with the definition in the Kansas Statute; the Statute was also added as cited. These revisions are consistent with 40 C.F.R. § 131.13 and the EPA hereby approves these revisions.

b. The KDHE revised **28-16-28c(b)(5)** as follows:

(5) Restrictions. ~~Wherever site conditions preclude the rapid dispersion and dilution of effluent within the receiving surface water or if, in the judgement of the secretary, the presence of a mixing zone would unduly jeopardize human health or any of the existing uses of the receiving surface water, The right to prohibit the use of mixing zones or to place more stringent limitations on mixing zones than those stipulated in paragraphs (b)(2), (3), and (13) of this regulation shall be reserved by the department secretary wherever site conditions preclude the rapid dispersion and dilution of effluent within the receiving surface water or if, in the judgement of the secretary, the presence of a mixing zone would unduly jeopardize human health or any of the existing uses of the receiving water.~~

The revision to this mixing zone provision simply rearranges the verbiage by adding the struck language to the end of the provision and clarifying the Secretary of the KDHE, rather than generally, "The Department," has the authority to restrict mixing zones. These revisions do not

change the substance of the provision, which EPA approved in the past. Therefore, these non-substantive revisions are approved.

C. Surface water classification and use designation – K.A.R. 28-16-28d

The KDHE revised **28-16-28d(d)(2)** as follows:

~~(2) A register of surface water classifications and use designations shall be maintained by the department. This register shall identify the designated uses of all listed major classified streams, lakes, wetlands, and ponds and shall list those streams, lakes, wetlands, and ponds recognized by the department as outstanding national resource waters or exceptional state waters. The use designations of listed surface waters or water bodies recognized as outstanding national resource waters or exceptional state waters shall be those identified in the department's "Kansas surface water register," as adopted by reference in K.A.R. 28-16-28g. Classified surface waters and their designated uses shall be identified and listed in the "Kansas surface water register," as adopted by reference in K.A.R. 28-16-28g.~~

This revision streamlines the provision by striking language that is already contained within the "Kansas surface water register" [sic] which is a rule referenced document as cited in the revision. These revisions do not change the substance of the provision, which the EPA approved in the past. Therefore, these non-substantive revisions are approved.

D. Kansas Water Quality Standards Tables of Numeric Criteria

a. Table 1a. Aquatic Life, Agriculture, and Public Health Designated Uses Numeric Criteria

K.A.R. 28-16-28e(e) (renumbered from K.A.R. 28-16-28e(d)) adopts by reference the *Kansas Surface Water Quality Standards: Tables of Numeric Criteria*. The KDHE adopted new or revised water quality criteria for several pollutants for the protection of aquatic life uses and of human health. The EPA approves those numeric water quality criteria revisions that result in criteria that are as stringent as EPA guidance under Section 304(a) of the CWA because they protect the designated uses as required by the CWA and EPA's implementing regulations at 40 CFR §§ 131.5(a)(2), 131.6(b),(c),(f), and 131.11(a) and (b)(1)(i). The EPA's actions on the revised and new criteria are contained in Table 1.

For some of the pollutants for which the EPA is today approving criteria, the original criteria were promulgated by the EPA under the National Toxics Rule (NTR) on December 22, 1992 (57 F.R. 60848). These state criteria are determined by the EPA to be fully protective of the applicable designated uses. The adoption by Kansas of these criteria is commendable and represents a vast improvement in the state's ability to protect the designated uses for its surface waters consistent with the purposes of the CWA.

On June 29, 2015, the EPA updated its national recommended water quality criteria for human health for 94 chemical pollutants to reflect the latest scientific information and EPA policies, including updated fish consumption rate, body weight, drinking water intake, health toxicity

values, bioaccumulation factors, and relative source contributions.² The EPA expects the KDHE to adopt the water quality criteria that were updated in the 2015 EPA Human Health Update during its next triennial review.

The WQS Clarification final rule (August 5, 2015) "... contains two revisions to the triennial review requirements at 40 CFR § 131.20(a). First, the rule requires that if states and authorized tribes choose not to adopt new or revised criteria during their triennial review for any parameters for which EPA has published new or updated criteria recommendations under CWA section 304(a), they must explain their decision when reporting the results of their triennial review to EPA under CWA section 303(c)(1) and 40 CFR § 131.20(c). The Rule also clarifies the 'applicable water quality standards' that states and authorized tribes must review triennially."³ These Rules will apply to future WQS submittals from KDHE.

b. Copper Biotic Ligand Model (BLM)

The KDHE adopted the copper biotic ligand model (BLM) statewide in Table 1a of the *Kansas Water Quality Standards Tables of Numeric Criteria*. The reference to "Table 1b for copper, total" in Table 1a was deleted and replaced with "BLM" and footnote "d." Footnote "d" states:

The Biotic Ligand Model (BLM) as in the "Aquatic Life Ambient Freshwater Quality Criteria-Copper 2007 Revision (EPA-822-R-07-001, February 2007)" which is adopted by reference.

The EPA submitted a public comment on November 19, 2014 that stated:

The KDHE has deleted equations for copper in Table 1b due to the state-wide adoption of the copper biotic ligand model for acute and chronic aquatic life. In the EPA's training materials on the implementation of the copper BLM,⁴ the EPA refers to the adoption of a statewide approach for the BLM. Kansas can develop numeric results up front when adopting the revised criteria or later when developing permits or conducting assessments. Under this approach, the BLM based criteria would replace the hardness-based criteria for copper. This approach allows Kansas to use the latest available science to the copper biotic ligand model for acute and chronic aquatic life. Please be aware that a statewide implementation option could increase costs for the state's monitoring programs, because some of the BLM inputs (particularly dissolved organic carbon) have not been routinely monitored.

The KDHE responded to the EPA's public comment letter on February 18, 2015, stating:

There are only a limited number of NPDES facilities with actual permits for copper (<10 facilities). NPDES facilities may incur additional costs for sample collection and analysis for a parameter required for the BLM if the facility opts for site specific input data rather

² <http://www.gpo.gov/fdsys/pkg/FR-2015-06-29/html/2015-15912.htm>

³ <http://www.gpo.gov/fdsys/pkg/FR-2015-08-21/html/2015-19821.htm>

⁴ http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/copper/upload/2007_04_12_criteria_copper_faqs_implementation-issues.pdf

than utilizing the stream chemistry data utilized by KDHE. The KDHE will be utilizing Total Organic Carbon (TOC) and translate these values to Dissolved Organic Carbon (DOC) through the appropriate ratio calculations.

The ratio value the KDHE selected to use came from the Aquatic Life Ambient Freshwater Quality Criteria – Copper, 2007 Revision, EPA-822-R-07-001, Appendix C-2, page C-36 and can also be found in the EPA document #822-B-98-005. The appropriate KDHE monitoring station will be utilized for site specific data. The state currently monitors for the BLM parameters, with the exception that the state monitors for TOC versus DOC and utilizes the ratio 0.7482 to calculate the DOC.

The science supporting the EPA's Section 304(a) recommended criteria for the copper biotic ligand model supports the EPA's conclusion that the KDHE's criteria will be protective of aquatic life uses. In addition to the revised water quality standards, KDHE staff also provided information indicating that Kansas has already collected sufficient data to implement the copper BLM criteria. As such, the adoption of the copper BLM in Kansas WQS is consistent with 40 C.F.R. §§ 131.6(b), (c), and 131.11(a) and (b)(1)(i), and the EPA hereby approves this new and revised criteria and the deletion of its previous hardness-based criteria in Table 1b.

The EPA looks forward to continued close collaboration with KDHE in implementing the freshwater copper BLM. The EPA recommends that in future triennial reviews Kansas consider adopting additional regulatory language to clarify the state's copper BLM implementation procedures. For example, the EPA encourages the state to outline its data requirements to run the BLM, its plan for how to calculate protective values for water bodies where no or few data are available, and its approach to integrate individual BLM results for a water body into protective values. In addition, because environmental conditions could change over time, for example if there are major land use changes in the watershed, the EPA recommends that Kansas WQS regulations require review of more recent data during permit renewal to facilitate periodic update (or confirmation) of the site-dependent copper calculations. Such regulatory specificity is critical to ensuring that BLM-based values are protective during the periods when copper is most bioavailable in the receiving water. The state should reconsider the use of the TOC: DOC ratio if further information shows that the ratio is not representative of the water bodies where the copper BLM is used. Finally, the state should also keep a list of locations/facilities where the copper BLM is being used across the state online on their website for the public to access this information and for the EPA to use as reference in all CWA programs (e.g., NPDES).

SECTION II: ITEMS ON WHICH THE EPA IS TAKING NO ACTION

A. Kansas Water Quality Standards Regulations: Definitions K.A.R. 28-16-28b. Point Source Definition.

(yy) [revised – previously (ss)] “Point Source” means any discernible, confined, and discrete conveyance including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or floating craft, from which pollutants are or could be discharged. This term may include structures or site conditions that act to collect

~~and convey stormwater runoff from roadways, urban areas, or industrial sites. This term shall not include agricultural stormwater discharges or return flow from irrigated agriculture land.~~

This definition of point source is not considered by the EPA to be a new Water Quality Standard, therefore the EPA is not acting on this definition.

B. Kansas Water Quality Standards Regulations – Non-Substantive Edits – K.A.R. 28-16-28b, 28-16-28c, 28-16-28d, 28-16-28e, 28-16-28f

Many non-substantive changes were made to various provisions in K.A.R. 28-16-26b through 28-16-28f. For example, the KDHE made wording changes to meet the current style requirements for regulations set by the Kansas Department of Administration, updated dates for citations of supporting statutes and regulation, updated citation cross-references for statutes and regulations incorporated by reference, and changed section numbering to accommodate provisions added or deleted. The EPA previously reviewed and approved each of the underlying provisions in question; the current revisions do not substantively change the meaning or intent of the existing approved WQS.

The EPA determined that the wording changes, cross-reference changes and renumbering of K.A.R. 28-16-26b through 28-16-28f were editorial, non-substantive changes to Kansas' EPA-approved water quality standards. The EPA is neither approving or disapproving these changes.

A list of these changes, including revised citation numbering, is included in Table 2.

C. Variances – K.A.R. 28-16-28f(d)

The KDHE revised K.A.R. 28-16-28f(d) to read:

(d) Variances. If, upon written application by a person, the secretary finds that by reason of substantial and widespread socioeconomic impact that strict enforcement of the water quality criteria of K.A.R. 28-16-28e(e)(d) is not feasible, a variance ~~may be permitted by the secretary~~ from those criteria may be permitted and adopted into regulations at the next systematic review or subsequent triennial review after public notification and opportunity for public comments.

(1) ~~The provisions of 40 C.F.R 131.10(g), as adopted by reference in K.A.R. 28-16-29b(III), shall be considered by the secretary in reviewing the need for a variance. Each person requesting a variance shall demonstrate compliance with 40 C.F.R 131.10(g), which is adopted by reference in K.A.R. 28-16-28b.~~

(2) In granting a variance, conditions and time limitations may be set by the secretary with the intent that progress be made toward improvements in surface water quality.

(3) ~~Each variance shall be granted only after public notification and opportunity for public comment. Each variance, once granted, shall be adopted into the regulations at the next systematic review or subsequent triennial review. No action that impacts water quality shall be granted a variance from the terms and conditions requirements of K.A.R. 28-16-28e(b).~~

This revised variance authorizing procedure and any subsequent variance issued under this provision constitutes a change to the WQS requiring EPA review pursuant to 40 CFR §§ 131.5 and 131.6. Water quality standard variances require similar substantive and procedural requirements as removing a designated use, but unlike use removal, variances are both discharger and pollutant specific, are time-limited, and do not forego the currently designated use of a water body. A variance is most appropriate where the State believes that the standard can be ultimately attained. By maintaining the standard rather than changing it, this provision provides a mechanism by which the State can assure that further progress is made in improving the water quality and attaining the standard. With a variance, National Pollutant Discharge Elimination System (NPDES) permits may be written such that reasonable progress is made toward attaining the standards without violating section 402(a)(1) of CWA, which requires that NPDES permits must meet the applicable WQS. State-adopted variances have been approved by EPA where, among other things, the state demonstrates, consistent with 40 CFR § 131, that meeting the standard is unattainable based on one or more of the grounds outlined in 40 CFR § 131.10(g). The variance is granted for a specified period of time and reexamined at least every three years as reasonable progress is made toward meeting the standards.

In its November 19, 2014, comment letter, the EPA noted the removal of K.A.R. 28-16-28f(d)(3), above, and commented that, “The WQS under public notice contain changes to the state’s variance procedures, including eliminating the public notice requirement. 40 CFR §§ 131.10 and 131.20(b) require public participation when variances are established, as variances are [changes to] WQS.” As a result of this comment, the KDHE revised item K.A.R. 28-16-28f(d)(1), and included the public notice requirement; the Kansas Department of Administration approved this revision on January 20, 2015, and the Attorney General certified this revision on February 3, 2015.

Kansas adopted and submitted to the EPA this provision prior to the finalization of the EPA’s 2015 WQS Clarification rule which provides much greater clarity on what the EPA’s expectations are regarding variances to WQS at the new 40 C.F.R. 131.14.

KDHE provided public notice, on July 7, 2017, of its intent to update the regulatory process for variances by further revising K.A.R. 28-16-28f(d) to be consistent with the EPA’s 2015 WQS Clarification rule noted above. The latest updates will allow for both individual *and* multiple discharger variances. EPA intends to act on the entirety of the state’s variance provisions when the KDHE formally submits its new regulatory variance process.

D. Kansas Water Quality Standards Tables of Numeric Criteria – Non-Substantive Edits

The KDHE made non-substantive edits to the *Kansas Surface Water Quality Standards: Tables of Numeric Criteria*. For example, to clarify the association of the water quality criteria in Table 1a to Chemical Abstract Service (CAS) numbers, the KDHE added CAS numbers to the pollutant parameters in Table 1a. The addition of these CAS numbers to Table 1a will assist both the KDHE and the EPA where different pollutants have more than one common name but the same CAS number. The EPA previously reviewed and approved each of the underlying provisions in question; the current revisions do not substantively change the meaning or intent of the existing approved WQS.

The EPA determined that the changes made to the *Kansas Surface Water Quality Standards: Tables of Numeric Criteria*, were editorial, non-substantive changes to Kansas' EPA-approved water quality standards. EPA is neither approving or disapproving these changes.

A list of these changes, including revised citation numbering, is included in the EPA's actions on the revised and new criteria contained in Table 2 at the end of this EPA decision document.

E. Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1h. Natural Background Concentrations.

On September 29, 2015, the KDHE and the EPA discussed the basis for the Kansas Natural Background Concentrations provision and concluded that the KDHE would revise this portion of the KS WQS rule and that the EPA would defer action awaiting that revision and submission.

F. Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1g. Temperature, Dissolved Oxygen, and pH Numeric Aquatic Life Criteria; New Footnote a(2) addressing Dissolved Oxygen – Natural Conditions.

The dissolved oxygen (DO) criteria used by Kansas is 5.0 mg/L for Special, Expected and Restricted Aquatic Life Uses. The KDHE added a new footnote, a(2), addressing implementation of the dissolved oxygen (DO) criteria as follows:

(2) Dissolved oxygen concentrations can be lower than 5.0 mg/L when caused by documented natural conditions specified in the "Kansas Implementation Procedures: Surface Water Quality Standards."

The section of this provision referenced in the "*Kansas Implementation Procedures: Surface Water Quality Standards*" is a new provision in this rule referenced document and is addressed below in Section H.

G. Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1g. Temperature, Dissolved Oxygen, and pH Numeric Aquatic Life Criteria. Footnote (a)3 addressing Dissolved Oxygen in lakes or reservoirs.

The KDHE added a new footnote, a(3), addressing implementation of the dissolved oxygen (DO) criteria as follows:

(3) For lakes or reservoirs experiencing thermal stratification, the dissolved oxygen criterion is only applicable to the top layer or epilimnion of the waterbody.

Supporting documentation is needed from the KDHE to be able to determine whether this approach is scientifically defensible and protective per requirements at 40 CFR § 131.11. Supporting documentation must include an explanation as to how the top layer or epilimnion, the metalimnion, and the hypolimnion will be defined. Of particular concern with this approach is that the DO criteria is excluded from protecting the metalimnion during stratification; this zone is of particular importance during hot summer months as refugia for aquatic life. The criteria must

be sufficient to protect designated uses and consistent with EPA's regulations at 40 CFR §§ 131.6(c) and 131.11(b)(1)(ii).

**H. Kansas Implementation Procedures, Surface Water Quality Standards (October 1, 2012)⁵:
Section III. Criteria, C. Naturally Occurring Conditions for Low Dissolved Oxygen
(DO) Criterion in Streams.**

The following new provision and explanatory statements were added to the Kansas Implementation Procedures:

C. Naturally Occurring Conditions for Low Dissolved Oxygen (DO) Criterion in Streams Applicable regulation: Kansas Surface Water Quality Standards: Tables of Numeric Criteria 1g

Some conditions that occur naturally can cause low dissolved oxygen levels in streams. Typically, the incidence of low dissolved oxygen occurs in the summer when water temperatures are high (reducing the ability of water to retain dissolved oxygen) and stream flows are low (reducing the ability of the stream to re-aerate itself or flush or dilute any oxygen-demanding substances present in the water). At times, the introduction of natural organic materials such as during periods of leaf fall can cause low dissolved oxygen levels in some segments of streams. Additionally, ground water reaching the surface through springs and seeps may have low dissolved oxygen. Digressions from the dissolved oxygen criterion under the above conditions should be excluded for the purposes of Section 303(d) of the Federal Clean Water Act.

Natural conditions contributing to the local digression of low dissolved oxygen should be documented during the field site visit. Factors including flow conditions, ambient air and water temperatures, presence of allochthonous organic matter from wildlife or riparian vegetation, dystrophic inputs to the stream from wetland areas and extended days of cloud cover should be noted at the time of sampling. Additionally, observations and samplings of the resident aquatic life community, including fish, mussels, macroinvertebrates and other shellfish should be made at the time of deficient oxygen to ascertain possible stress on the biota or lack thereof. These ancillary data and information will be used in the Section 303(d) listing and assessment process to determine whether the incident of low dissolved oxygen can be discounted.

The EPA provided comments (11/19/2014) on this provision during the public notice of the new and revised KS WQS. Specifically, EPA stated the following:

“Supporting documentation will be needed to demonstrate that a given approach is scientifically defensible and protective per the requirements of 40 C.F.R. § 131.11 if the EPA determines if this is a change in WQS. The criteria must be sufficient to protect

⁵ Kansas Implementation Procedures, Surface Water Quality Standards dated October 1, 2012; while the state made revisions to this document as part of their triennial review, the date of the document was not updated to reflect these revisions.

designated uses and consistent with the EPA's regulations at 40 C.F.R. §§ 131.6(c) and 131.11(b)(1)(ii). Supporting documentation consistent with the expectations of naturally occurring conditions articulated in this provision will also be needed to substantiate that the low dissolved oxygen conditions are indeed due to naturally-occurring, non-anthropogenic contributions."

The KDHE responded (2/18/2015) with the following:

"KDHE understands it will be necessary to provide any applicable supporting documentation to EPA on a case-by-case basis for waterbodies where the new criteria will be implemented."

EPA's regulations at 40 CFR § 131.11 require states to adopt water quality criteria that protects the designated use and is based on a sound scientific rationale. In addition, EPA's regulations allow states to establish numeric criteria based on 304(a) Guidance modified to reflect site specific conditions. EPA's 1986 DO criteria recommendations, published pursuant to section 304(a) of the CWA, state that alternative criteria may be appropriate "where natural conditions alone" create the DO concentrations. It goes on to say that "absolutely no anthropogenic dissolved oxygen depression in the potentially lethal area below the 1-day minima should be allowed unless special care is taken to ascertain the tolerance of resident species to low dissolved oxygen."

Also in KDHE's response to the EPA's comments was a statement made in regards to Application of criteria for designated uses of surface waters (page 5):

"Most Kansas impairments are, in fact, anthropogenic because of land and water activities, regardless if the substance is natural or synthetic."

The EPA expects the KDHE to submit methods used and analyses conducted to develop site-specific DO criteria, on a site-specific basis, that demonstrate support of the aquatic life use designation per 40 CFR § 131.6; this demonstration includes naturally-occurring low DO. The EPA must approve any new site-specific DO criteria in order for the criteria to be effective and implementable for CWA purposes in Kansas.

**I. Kansas Implementation Procedures, Surface Water Quality Standards (October 1, 2012)⁶:
Page 10; Effective Frequency and Durations of Criteria Digressions for Indicating
Impairment by Pollutants***

The new Table "*Effective Frequency and Durations of Criteria Digressions for Indicating Impairment by Pollutants*" in the Kansas Implementation Procedures provides information for the, "sole purpose of assessment under Section 303(d) of the CWA," according to the asterisk at the bottom of the table.⁷

⁶ Ibid.

⁷ *For the purposes of assessment under Section 303(d) of the Clean Water Act, this table displays the thresholds of frequency for pollutant concentrations that exceed numeric criteria within the Surface Water Quality Standards to indicate impairment of

Several of the pollutant classes identified in the Table are assigned frequencies and durations that are intended to *only* be used for listing purposes under Section 303(d) of the CWA, and thus are not considered to be new WQS. EPA's review included in this enclosure of the state's wqs submission is limited to Section 303(c) of the CWA. EPA does not approve or disapprove assessment methodologies for the purpose of CWA Section 303(d); under Section 303(c)(3), the status of this provision will be determined under the applicable requirements of the CWA Section 303(d) program that the provision is intended to implement.

If it is the intent of the State in the future to revise water quality standard to include frequency and duration components, the revisions should be shown in the Kansas Tables of Numeric Criteria (Table 1a). These revisions should be consistent with the Kansas regulations at K.A.R. 28-16-28e(d). The federal regulation at 40 CFR § 131.11(b) provides that in establishing criteria, states should set numerical values based on the EPA's recommendations under Section 304(a) of the CWA or other scientifically defensible methods. These recommendations generally consist of a magnitude (the level of pollutant that is allowable, usually expressed as a concentration), duration (*e.g.*, the period of time over which the instream concentration is averaged for comparison with criteria concentrations), and frequency (how often a particular criterion can be exceeded).

J. Application of criteria for designated uses of surface waters – K.A.R. 28-16-28e(c)(3)

The KDHE added a new provision regarding the application of criteria for designated uses of surface waters in the CWA Section 303(d) program (**K.A.R. 28-16-28e(c)(3)**):

Each digression shall be assessed by the secretary for purposes of section 303(d) of the federal clean water act, with consideration of acceptable duration and frequency of the digression and representation of actual ambient conditions by environmental monitoring data, as specified in the "Kansas implementation procedures: surface water quality standards."

As noted above, the EPA does not approve or disapprove assessment methodologies for the purpose of CWA Section 303(d); under Section 303(c)(3), the status of this provision will be determined under the applicable requirements of the CWA Section 303(d) program that the provision is intended to implement.

K. Kansas Surface Water Quality Standards (February 18, 2015); Page 37: 28-16-28e(d)(3)(C):

(C) Any substance derived from an artificial source that, alone or in combination with other synthetic or naturally occurring substances, causes toxic, carcinogenic, teratogenic, or mutagenic effects in humans shall be limited to nonharmful concentrations in surface waters. Unless site-specific water quality conditions warrant the promulgation of more protective criteria under the provisions of subsection (a) of this regulation and K.A.R. 28-16-28f(f), maximum contaminant levels for toxic, carcinogenic, teratogenic, or mutagenic

the designated uses assigned to waters of the state. Typical ambient sampling implies duration of one hour for acute criteria, 4 days for chronic criteria at stable flow and 70 years for water supply or food procurement as a lifetime average.

substances promulgated by the United States environmental protection agency pursuant to specified in 40 C.F.R. 141.11 through 141.16, 141.13, and 40 C.F.R. 141.60 141.61 through 141.66, dated July 1, 2003 and adopted by reference in K.A.R. 28-16-28b(hh) 2012, shall be deemed nonharmful by the department and adopted as domestic water supply criteria.

This provision was revised to update Maximum Contaminant Level (MCL) citations from 40 CFR §141 that implement Section 1412 of the Safe Drinking Water Act, 42 U.S.C. § 300g-1. This provision previously appeared to require the adoption of criteria equal to the MCLs. While waters with *only* a drinking water supply (water consumption) use may be sufficiently protected by MCLs, this approach would not be protective of waters that also have aquatic life and/or food procurement designated uses and thus have fish consumption exposure pathways. States and authorized tribes must adopt water quality criteria that protect designated uses (*emphasis added*) (40 CFR § 131.11(a)(1)). MCLs are not solely risk-based values, but are calculated as a function of toxicity, treatment capability and cost considerations. Therefore, in some instances, may not be protective of the designated uses. However, the strikethrough (above) of "... and adopted by reference in KAR 28-16-28b(HH)" and "by the department and adopted as domestic water supply criteria" renders that requirement as moot resulting in this provision not being a WQS and therefore the EPA has no authority to act upon.

L. Kansas Surface Water Quality Standards Tables of Numeric Criteria (January 21, 2015): Table 1a. Aquatic Life, Agriculture, and Public Health Designated Uses Numeric Criteria. Five new or revised water quality criteria for pollutants: Mercury, 1,2-dichloropropane, 1,2,4-trichlorobenzene, barium, and endrin.

The KDHE adopted new water quality criteria (equivalent to Maximum Contaminant Levels) for toxic pollutants that would replace criteria that currently protect the state's domestic water supply use. Many of the state's existing domestic water supply use criteria were promulgated by the EPA under the Agency's 1992 National Toxics Rule (NTR).

The EPA stated in the NTR that the Agency was promulgating its 304(a)-recommended human health "water + organism criteria" for all waters in Kansas where public water supply and aquatic life uses were designated. In Kansas, all classified waters have a designated aquatic life use. The final NTR specifically stated the following on page 68060:

(7) For human health, the "water + fish" criteria in Column **D1** of § 131.36(b) are promulgated for all waterbodies where public water supply and aquatic life uses are designated, except as provided for elsewhere in these rules (e.g., rule 9).

The EPA also stated in the NTR that "water + organism" criteria were promulgated *instead of* MCLs. The rationale was to ensure that both water and fish consumption exposure pathways were adequately addressed and human health was protected. The final NTR language, on page 68060, is as follows:

(10) For priority toxic pollutants where the State has adopted human health criteria and received EPA approval, but such criteria do not fully satisfy section 303(c)(2)(B)

requirements, the rule includes human health criteria for such pollutants. For example, consider a case where a State **has** a water supply segment that poses an exposure risk to human health from both water and fish consumption. **If** the State has adopted, and received approval for, human health criteria based on water consumption only (e.g., Safe Drinking **MCLs**) which are less stringent than the "water + fish" criteria in Column **D1** of § 131.36(b), the Column **D1** criteria are promulgated for those water supply segments. The rationale for this is to ensure that both water and fish consumption exposure pathways are adequately addressed and **human** health is **fully** protected. If the State has adopted water consumption only criteria which are more stringent or equal to the Column **D1** criteria, the "water + fish" criteria in Column **D1** **criteria are not promulgated**.

The Kansas domestic water supply use is characterized as the consumption of water after treatment. However, the designated use is also associated with water + organism water quality criteria promulgated under the NTR. While waters with *only* a drinking water supply (water consumption) use may be sufficiently protected by MCLs, this approach would not be protective of waters that also have aquatic life and/or food procurement designated uses and thus have fish consumption exposure pathways. States and authorized tribes must adopt water quality criteria that protect designated uses (*emphasis added*) (40 CFR § 131.11(a)(1)). Criteria must be based on a sound scientific rationale and contain sufficient parameters or constituents to protect the designated uses. Criteria may be expressed in either narrative or numeric form. The EPA's regulations provide that states and authorized tribes should adopt numeric water quality criteria based on:

- 1) EPA's recommended section 304(a) criteria; or
- 2) EPA's recommended section 304(a) criteria modified to reflect site specific conditions;
or
- 3) Other scientifically defensible methods. (40 CFR § 131.11(b)).

In this WQS submission, the KDHE adopted a new water quality criterion (WQC) for mercury based on the current MCL under the Safe Drinking Water Act; there is no 304(a) recommendation for mercury. The KDHE adopted WQC equivalent to MCLs for four additional pollutants (1,2 dichloropropane, and 1,2,4 trichlorobenzene, Barium, and Endrin) for the domestic water supply use that have more stringent Section 304(a) recommendations.

- Mercury, total. This compound is under the NTR. The NTR promulgation was for 0.14 µg/L. There is no current EPA 304(a) recommendation. The KDHE adopted 2 µg/L, which is the MCL.
- 1,2-dichloropropane- The current EPA 304(a) recommendation is 0.9 µg/L; this criterion was updated in 2015 prior to the KDHE's adoption of 5 µg/L, which is the MCL. The current EPA approved WQC is 0.5 µg/L; this was the 304(a) recommendation prior to the 2015 update.
- 1,2,4-trichlorobenzene- The current EPA 304(a) recommendation is 0.071 µg/L; this criterion was updated in 2015 prior to the KDHE's adoption of 70 µg/L, which is the MCL. The current EPA approved WQC is 260 µg/L; this criterion is based on an EPA

2002 update.

- Barium- The EPA 304(a) recommendation is 1000 µg/L and the KDHE adopted 2000 µg/L, which is the MCL. The current EPA approved WQC for barium is 1000 µg/L; this criterion is based on the EPA's 1986 Quality Criteria for Water (Gold Book) value.
- Endrin- The EPA 304(a) recommendation is 0.03 ug/L; this criterion was updated in 2015 prior to the KDHE's adoption of 2 µg/L, which is the MCL. The current EPA approved WQC is 0.76 µg/L; this criterion is based on an EPA 2002 update.

The WQS submitted by the State did not include information explaining how these new or revised criteria are scientifically defensible or how they are protective of the state's combined domestic water supply/human health water + organism uses established by the EPA under the NTR. Because no explanation was provided, Kansas' adoption of these criteria is not consistent with 40 C.F.R. §§ 131.6(b), (c), (f), and 131.11(a) and (b)(1)(i). It appears the KDHE was relying on the provision discussed directly above in Section G (28-16-28e(d)(3)(C)), which directs the KDHE to adopt MCL's "*Unless site-specific water quality conditions warrant the promulgation of more protective criteria....*" KDHE may believe these pollutants are not "*harmful*" to the water+organism exposure pathway. If that is the case, the EPA requests further justification from the KDHE as to how these criteria are protective even when there are possible additional exposure routes.

Unless the KDHE can demonstrate that these criteria are protective of a human health water + organism designated use, the State should adopt any new or updated Section 304(a) recommended criteria for these compounds as part of its next triennial review process to ensure that state water quality criteria reflect sound science and protect applicable designated uses.

Federal water quality criteria currently applicable to Kansas waters remain in effect until the EPA takes federal action to withdraw these NTR criteria. Until such time, Kansas must continue to use the federally promulgated criteria as the basis for all water quality control activities such as NPDES permitting and Section 401 water quality certifications.

SECTION III: STATE DELETION OF PREVIOUS EPA DISAPPROVAL

A. General Provisions – K.A.R. 28-16-28c

The KDHE revised 28-16-28c(c)(2) by deleting high-flow exclusion provisions previously disapproved by the EPA in 2005:

(2) High flow. Any classified stream segment may be exempted by the secretary from the application of the numeric criteria for E. coli specified in tables 1i and 1j of the "Kansas surface water quality standards: tables of numeric criteria," which is adopted by reference in K.A.R. 28-16-28e(d), if any of the following conditions is met:

(A) The flow is equal to or greater than the flow that is exceeded 10 percent of the time for any classified stream segment with a mean flow of less than 30 cubic feet per second.

(B) The flow is equal to or greater than 50 percent of the two year flood flow for a classified

~~stream segment that has a mean flow of 30 or more cubic feet per second but less than 900 cubic feet per second.~~

~~(C) The flow is equal to or greater than the two year flood flow for any classified stream segment that has a mean flow great than 900 cubic feet per second.~~

In a decision letter dated April 27, 2005, the EPA disapproved the Kansas WQS provision at K.A.R. 28-16-28c(c)(2) allowing for an exclusion from the application of water quality numeric criteria for *E. coli* to stream segments during periods of "high flow." The EPA determined that this provision was inconsistent with federal regulations at 40 C.F.R. §§ 131.5(a)(2) and 131.11(a), which require that states adopt criteria that protect designated beneficial uses. The April 27, 2005, disapproval explained that the high flow exclusion provision in the Kansas WQS was not effective for CWA purposes and that no further federal action was required.

The EPA acknowledges Kansas' deletion of the high flow exclusion, formerly at K.A.R. 28-16-28c(c)(2), which is consistent with the EPA's disapproval of this provision in April 2005.

Table 1: Summary of the EPA actions on Kansas Water Quality Criteria (WQC) located in Table 1a: Aquatic Life, Agriculture, and Public Health Designated Uses Numeric Criteria.

New or revised WQC are underlined.

AL: aquatic life, FP: food procurement, DWS: domestic water supply.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
METALS (µg/L)						
arsenic (III)	<u>a</u>	360	50	b <u>0.14</u>	b <u>0.018</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
barium, <u>total</u>	<u>7440393</u>	a	a	A	1000 <u>2000</u>	No Action. The KDHE did not adopt the EPA's 304(a) recommendation for domestic water supply. See decision letter for more information.
copper, total	<u>7440508</u>	table 1b <u>BLM^d</u>	table 1b <u>BLM^d</u>	A	1300 <u>1000</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation for domestic water supply. The KDHE also adopted the copper BLM for acute and chronic aquatic life which is the current EPA 304(a) recommendation.
mercury, total	<u>7439976</u>	1.4	0.77	0.146	b <u>2</u>	No Action. The KDHE did not adopt the EPA's 304(a) recommendation. See decision letter for more information.
selenium, total	<u>7782492</u>	20	5	4,200	170 <u>50</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.
silver, total	<u>7440224</u>	table 1b	a	a	50 <u>100</u>	Approve. The KDHE provided additional information regarding the protectiveness of this WQC for the designated use.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
thallium, total	<u>7440280</u>	1,400	40	b <u>6.3^b</u>	2	Non-Substantive Edit
zinc, total	<u>7440666</u>	table 1b	table 1b	26,000	7400 <u>5000</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.
OTHER INORGANIC SUBSTANCES (µg/L)						
asbestos (fibers>10µm) (µmillion-fibers/L)	<u>12001295</u>	a	a	a	7-0000000	Non-Substantive Edit
phosphorus, elemental (white)	<u>7723140</u>	a	0.1 a	a	A	Approve. The KDHE removed a WQC for which the EPA does not have a current EPA 304(a) recommendation.
ORGANIC SUBSTANCES (µg/L) (EXCEPT PESTICIDES)						
<u>A. Halogenated Ethers</u>						
1,2 (2-chloroethyl)_ether	<u>111444</u>	238,000	a	0.53	b <u>0.030</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
bis(2-chloroisopropyl)_ether	<u>108601</u>	238,000	a	65,000	b <u>1400</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
1,2-dichloroethane	<u>107062</u>	18,000	2,000	b <u>99^b</u>	b <u>0.38^b</u>	Non-Substantive Edit
hexachloroethane	<u>67721</u>	980	540	3.3	b <u>1.9^b</u>	Non-Substantive Edit
1,1,2,2-tetrachloroethane	<u>79345</u>	9,320	2,400	3.3 <u>4.0</u>	b <u>0.17</u>	Approve the DWS criterion; the KDHE adopted EPA's 304(a) recommendation.
1,1,2-trichloroethane	<u>79005</u>	18,000	9,400	16	b <u>0.6^b</u>	Non-Substantive Edit
<u>Chlorinated ethenes</u>						
chloroethylene (vinyl chloride)	<u>75014</u>	a	a	525 <u>2.4</u>	2	Approve. The KDHE adopted the EPA's 304(a) recommendation published prior to the EPA's 2015

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
						Human Health criteria updates (published prior to the KDHE's 2015 WQS submission).
1,1-dichloroethylene	<u>75354</u>	11,600	a	7,100	b <u>7</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.
trans-1,2-dichloroethylene	<u>156605</u>	11,600	a	140000 <u>10,000</u>	100	Approve. The KDHE adopted the EPA's 304(a) recommendation.
tetrachloroethylene (PCE)	<u>127184</u>	5,280	840	3.3	5 <u>0.8^b</u>	Non-Substantive Edit
trichloroethylene (TCE)	<u>79016</u>	45,000	21,900	30	5 <u>2.7^b</u>	Non-Substantive Edit
<i>Chlorinated propanes/propenes</i>						
1,2-dichloropropane	<u>78875</u>	23,000	5,700	15	0.5 <u>5</u>	No Action. The KDHE did not adopt the EPA's 304(a) recommendation. See decision letter for more information.
1,3-dichloropropene	<u>542756</u>	6600 <u>6060</u>	244	14.1	b <u>10^b</u>	DWS WQC is a Non-Substantive Edit. Approve the adopted 304(a) recommendation for acute aquatic life.
<i>Halogenated methanes</i>						
bromodichloromethane (dichlorobromomethane)	<u>75274</u>	11,000	a	17	b <u>0.55</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation for domestic water supply.
dibromochloromethane (chlorodibromomethane)	<u>124481</u>	11,000	a	13	b <u>0.4</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation for domestic water supply.
dichloromethane (methylene chloride)	<u>75092</u>	11,000	a	590	4.7 <u>5</u>	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
tetrachloromethane (carbon tetrachloride)	<u>56235</u>	35,200	a	b 4.4 ^b	5 0.25 ^b	Non-Substantive Edit
tribromomethane (bromoform)	<u>75252</u>	11,000	a	140	b 4.3	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation for domestic water supply.
trichloromethane (chloroform)	<u>67663</u>	28,900	1,240	470	b 5.7	Approve. The KDHE adopted the EPA's 304(a) recommendation.
<i>Other halogenated aliphatic hydrocarbons</i>						
hexachlorobutadiene	<u>87683</u>	90	9.3	18	b 0.44	Approve. The KDHE adopted the EPA's 304(a) recommendation.
hexachlorocyclopentadiene	<u>77474</u>	7	5.2	206 1,100	50	Approve. The KDHE adopted the EPA's 304(a) recommendation.
benzene	<u>71432</u>	5,300	a	51	5 1.2 ^b	Non-Substantive Edit
ethylbenzene	<u>100414</u>	32,000	a	28712 2,100	700	Approve. The KDHE adopted the EPA's 304(a) recommendation.
nitrobenzene	<u>98953</u>	27,000	a	690	b 17	Approve. The KDHE adopted the EPA's 304(a) recommendation.
Chlorinated benzenes						
chlorobenzene	<u>108907</u>	250	50	1,600	130-100	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.
1,2-dichlorobenzene (o-dichlorobenzene)	<u>95501</u>	1,120	763	2600 1300	600	Approve. The KDHE adopted the EPA's 304(a) recommendation.
1,3-dichlorobenzene (m-dichlorobenzene)	<u>541731</u>	1,120	763	960	b 400 ^b	Non-Substantive Edit
1,4-dichlorobenzene (p-dichlorobenzene)	<u>106467</u>	a	a	2600-190	75	Approve. The KDHE adopted the EPA's 304(a) recommendation.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
hexachlorobenzene	<u>118741</u>	6	3.7	0.00029	b <u>0.00075^b</u>	Non-Substantive Edit
other chlorinated benzenes, total	<u>a</u>	250	50	a	a	Non-Substantive Edit
pentachlorobenzene	<u>608935</u>	250	50	1.5	1.4	Non-Substantive Edit
1,2,4,5-tetrachlorobenzene	<u>95943</u>	250	50	1.1	0.97	Non-Substantive Edit
1,2,4-trichlorobenzene	<u>120821</u>	250	a	940 <u>70</u>	260 <u>70</u>	The EPA approves the revised WQC for food procurement and drinking water supply because the KDHE adopted the EPA's 304(a) recommendation.
<i>Toluenes and xylenes</i>						
2,4-dinitrotoluene	<u>121142</u>	330	230	3.4	b <u>0.11</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
dinitrotoluenes, total	<u>25321146</u>	330	230	9.1	a	
toluene	<u>108883</u>	17,500	a	b <u>15,000</u>	1,000	Approve. The KDHE adopted the EPA's 304(a) recommendation.
xylenes, total	<u>1330207</u>	a	a	a	10,000	Non-Substantive Edit
<u>D. Nitrogen Compounds Except Monocyclic Aromatics</u>						
acrylonitrile	<u>107131</u>	7,550	2,600	0.25	b <u>0.059^b</u>	Non-Substantive Edit
benzidine	<u>92875</u>	2,500	a	0.0002	b <u>0.00012^b</u>	Non-Substantive Edit
3,3-dichlorobenzidine	<u>91941</u>	a	a	0.02 <u>0.028</u>	b <u>0.04^b</u>	Non-Substantive Edit
1,2-diphenylhydrazine	<u>122667</u>	270	a	0.2	b <u>0.04^b</u>	Non-Substantive Edit
nitrosamines, total	<u>a</u>	5,850	a	1.24	0.0008	Non-Substantive Edit
N-nitrosodibutylamine	<u>924163</u>	5,850	a	0.22	0.0063	Non-Substantive Edit

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
N-nitrosodiethanolamine	<u>1116547</u>	5,850	a	1.24	a	Non-Substantive Edit
N-nitrosodiethylamine	<u>55185</u>	5,850	a	1.24	0.0008	Non-Substantive Edit
N-nitrosodimethylamine	<u>62759</u>	5,850	a	3	b <u>0.00069</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
N-nitrosodiphenylamine	<u>86306</u>	5,850	a	6	b <u>5^b</u>	Non-Substantive Edit
N-nitrosodi-n-propylamine	<u>621647</u>	a	a	0.51	0.005	Non-Substantive Edit
N-nitrosopyrrolidine	<u>930552</u>	5,850	a	34	0.016	Non-Substantive Edit
E. Phenolic Compounds						
2,4-dimethyl phenol	<u>105679</u>	1,300	530	850	380	Non-Substantive Edit
2,4-dinitrophenol	<u>51285</u>	a	a	5,300	b <u>69</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
nitrophenols, total	<u>a</u>	230	150	a	a	Non-Substantive Edit
phenol	<u>108952</u>	10,200	2,560	1,700,000 <u>860,000</u>	b <u>10,000</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
<i>Chlorinated phenols</i>						
2-chlorophenol	<u>95578</u>	4,380	2,000	150	81	Non-Substantive Edit
3-chlorophenol	<u>108430</u>	a	a	29,000	a	Non-Substantive Edit
2,4-dichlorophenol	<u>120832</u>	2,020	365	b <u>790^b</u>	b <u>93^b</u>	Non-Substantive Edit
3-methyl-4-chlorophenol	<u>59507</u>	30	a	a	a	Non-Substantive Edit
2,4,5-trichlorophenol	<u>95954</u>	100	63	3,600	1,800	Non-Substantive Edit
2,4,6-trichlorophenol	<u>88062</u>	a	970	2.4	b <u>2.1^b</u>	Non-Substantive Edit
F. Phthalate Esters						
butylbenzyl phthalate	<u>85687</u>	a	a	1,900	1,500	Non-Substantive Edit
dibutyl phthalate (<u>di-n-butyl phthalate</u>)	<u>84742</u>	940	3	b <u>4500</u>	b <u>2,000</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
diethyl phthalate	<u>84662</u>	a	a	b <u>44000</u>	17,000	Approve. The KDHE adopted the EPA's 304(a) recommendation.
dimethyl phthalate	<u>131113</u>	940	3	1,100,000	b <u>270,000</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
bis di(2-ethylhexyl) phthalate (DEHP)	<u>117817</u>	400	360	b <u>5.9^b</u>	b <u>1.8^b</u>	Non-Substantive Edit
phthalates, total	<u>a</u>	940	3	a	a	
G. Polynuclear Aromatic Hydrocarbons (PAHs)						
acenaphthene	<u>83329</u>	1,700	520	990	670	Non-Substantive Edit
acenaphthylene	<u>208968</u>	a	a	0.0311	a	Non-Substantive Edit
anthracene	<u>120127</u>	a	a	40,000	b <u>9,600^b</u>	Non-Substantive Edit
benzo(a)anthracene	<u>56553</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
benzo(a)pyrene	<u>50328</u>	a	a	0.018	b <u>0.0028^b</u>	Non-Substantive Edit
benzo(b)fluoranthene	<u>205992</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
benzo(g,h,i)perylene	<u>191242</u>	a	a	0.0311	a	Non-Substantive Edit
benzo(k)fluoranthene	<u>207089</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
2-chloronaphthalene	<u>91587</u>	a	a	1,600	1,000	Non-Substantive Edit
chrysene	<u>218019</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
dibenzo(a,h)anthracene	<u>53703</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
fluoranthene	<u>206440</u>	3,980	a	b <u>370^b</u>	b <u>300^b</u>	Non-Substantive Edit
fluorene	<u>86737</u>	a	a	5,300	b <u>1,300^b</u>	Non-Substantive Edit

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
indeno(1,2,3-cd)pyrene	<u>193395</u>	a	a	0.018	b <u>0.0038</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
naphthalene	<u>91203</u>	2,300	620	a	a	Non-Substantive Edit
phenanthrene	<u>85018</u>	30	6.3	0.0311	a	Non-Substantive Edit
pyrene	<u>129000</u>	a	a	4,000	b <u>960^b</u>	Non-Substantive Edit
Polynuclear Aromatic Hydrocarbons, total (PAHs)	a	a	a	0.0311	0.2	Non-Substantive Edit
H. Miscellaneous Other Organics (Except Pesticides)						
di(2-ethylhexyl) adipate	<u>103231</u>	a	a	A	500 <u>400</u>	Approve. The KDHE adopted a WQC more stringent than the current EPA approved WQC.
isosphorone	<u>78591</u>	117,000	a	b <u>960</u>	b <u>35</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
polychlorinated biphenyls, total (PCBs)	a	2	0.014	0.000064	b <u>0.00017^b</u>	Non-Substantive Edit
dioxin (2,3,7,8-TCDD) (dioxin)	<u>1746016</u>	0.01	0.00001	0.00000000 05 <u>5.0E-9</u>	b <u>1.3E-8^b</u>	Non-Substantive Edit
PESTICIDES (µg/L)						
acrolein	<u>107028</u>	68	21	290	190	Non-Substantive Edit
acrylamide	<u>79061</u>	a	a	A	0.01	Non-Substantive Edit
alachlor (Lasso)	<u>15972608</u>	760	76	A	2	Non-Substantive Edit
aldicarb	<u>116063</u>	a	a	A	3	Non-Substantive Edit
aldicarb sulfone	<u>1646884</u>	a	a	a	2	Non-Substantive Edit
aldicarb sulfoxide	<u>1646873</u>	a	a	a	3	Non-Substantive Edit
aldrin	<u>309002</u>	3	0.001	0.00005	b <u>0.00013^b</u>	Non-Substantive Edit

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
atrazine (Aatrex)	<u>1912249</u>	170	3	a	3	Non-Substantive Edit
bromomethane (<u>methyl bromide</u>)	<u>74839</u>	11,000	a	1,500	b <u>47</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
bromoxynil (MCPA)	<u>1689845</u>	a	a	a	a	Non-Substantive Edit
carbaryl (Sevin)	<u>63252</u>	a	0.02	a	a	Non-Substantive Edit
carbofuran (Furadan)	<u>1563662</u>	a	a	a	40	Non-Substantive Edit
chlordane	<u>57749</u>	2.4	0.0043	0.00081	b <u>0.00057^b</u>	Non-Substantive Edit
chlorpyrifos	<u>2921882</u>	0.083	0.041	a	a	Non-Substantive Edit
2,4-D	<u>94757</u>	a	a	a	100 <u>70</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
dacthal (DCPA)	<u>1861321</u>	a	14,300	a	a	Non-Substantive Edit
dalapon	<u>75990</u>	a	110	a	200	Non-Substantive Edit
<i>DDT and Metabolites</i>						
4,4-DDD (p,p-DDD)	<u>72548</u>	a	a	0.00031	b <u>0.00031</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation published prior to the EPA's 2015 Human Health criteria updates (published prior to the KDHE's 2015 WQS submission).
4,4-DDE (p,p-DDE)	<u>72559</u>	1,050	a	0.00022	b <u>0.00022</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation published prior to the EPA's 2015 Human Health criteria updates (published prior to the KDHE's 2015 WQS submission).
DDT, total	<u>50293</u>	1.1	0.001	0.000024 <u>0.00022</u>	b <u>0.00022</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation published prior to the EPA's 2015

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
						Human Health criteria updates (published prior to the KDHE's 2015 WQS submission).
diazinon (spectracide)	<u>333415</u>	a <u>0.17</u>	0.08 <u>0.17</u>	a	a	Approve. The KDHE adopted the EPA's 304(a) recommendation
dibromochloropropane (DBCP)	<u>96128</u>	a	a	15.7	0.2	Non-Substantive Edit
1,2-dibromoethane	<u>106934</u>	a	a	a	0.05	Non-Substantive Edit
dieldrin	<u>60571</u>	0.24	0.056	0.000054	b <u>0.00014</u> ^b	Non-Substantive Edit
4,6-dinitro-o-cresol	<u>534521</u>	a	a	280	b <u>13</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation.
dinoseb (DNBP)	<u>88857</u>	a	a	a	7	Non-Substantive Edit
diquat	<u>85007</u>	a	a	a	20	Non-Substantive Edit
disulfoton (Di-syston)	<u>298044</u>	a	a	a	a	Non-Substantive Edit
endosulfan, total	<u>115297</u>	0.22	0.056	159	b <u>a</u>	Non-Substantive Edit
alpha-endosulfan	<u>959998</u>	0.22	0.056	89	62	Non-Substantive Edit
beta-endosulfan	<u>33213659</u>	0.22	0.056	89	62	Non-Substantive Edit
endosulfan sulfate	<u>1031078</u>	a	a	b <u>89</u>	b <u>62</u>	Approve. The KDHE adopted the EPA's 304(a) recommendation published prior to the EPA's 2015 Human Health criteria updates (published prior to the KDHE's 2015 WQS submission).
endothall	<u>145733</u>	a	a	a	110 <u>100</u>	Approve.

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
endrin	<u>72208</u>	0.086	0.036	0.81 0.060	0.76 2	No Action. The KDHE did not adopt the EPA's 304(a) recommendation.
endrin aldehyde	<u>7421934</u>	a	a	0.3	b 0.76 ^b	Non-Substantive Edit
epichlorohydrin	<u>106898</u>	a	a	a	4	Non-Substantive Edit
ethylene dibromide	<u>106934</u>	a	a	a	0.05	Non-Substantive Edit
fenchlorfos (Ronnel)	<u>299843</u>	a	a	a	a	Non-Substantive Edit
glyphosate (Roundup)	<u>1071836</u>	a	a	a	700	Non-Substantive Edit
guthion	<u>86500</u>	a	0.01	a	a	Non-Substantive Edit
heptachlor	<u>76448</u>	0.52	0.0038	0.000079	b 0.00021 ^b	Non-Substantive Edit
heptachlor epoxide	<u>1024573</u>	0.52	0.0038	b 0.00011 ^b	b 0.00010 ^b	Non-Substantive Edit
hexachlorocyclohexane (HCH or BHC)	<u>61876</u>	100	a	0.0414	0.0123	Non-Substantive Edit
alpha-HCH (alpha-BHC)	<u>319846</u>	100	a	0.0049	b 0.0039 ^b	Non-Substantive Edit
beta-HCH (beta-BHC)	<u>319857</u>	100	a	b 0.046 ^b	b 0.014 ^b	Non-Substantive Edit
delta-HCH (delta-BHC)	<u>319868</u>	100	a	a	a	Non-Substantive Edit
gamma-HCH (gamma- BHC, lindane)	<u>58899</u>	0.95	0.08	0.0625 1.8	b 0.2	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.
technical-HCH (technical- BHC)	<u>608731</u>	a	a	0.0414	a	Non-Substantive Edit
malathion	<u>121755</u>	a	0.1	a	a	Non-Substantive Edit
methoxychlor	<u>72435</u>	a	0.03	a	40	Non-Substantive Edit
methyl parathion	<u>298000</u>	a	a	a	a	Non-Substantive Edit

PARAMETER	CAS #	Acute AL	Chronic AL	FP	DWS	EPA ACTION
metribuzin (Sencor)	<u>21087649</u>	a	100	a	a	Non-Substantive Edit
mirex	<u>2385855</u>	a	0.001	0.000097	a	Non-Substantive Edit
oxamyl (Vydate)	<u>23135220</u>	a	0.001	a	200	Non-Substantive Edit
parathion	<u>56382</u>	0.065	0.013	a	a	Non-Substantive Edit
pentachloronitrobenzene	<u>82688</u>	250	50	a	a	Non-Substantive Edit
pentachlorophenol (PCP)	<u>87865</u>	table 1b	table 1b	3	b 0.28 ^b	Non-Substantive Edit
picloram (Tordon)	<u>1918021</u>	a	a	a	500	Non-Substantive Edit
propachlor (Ramrod)	<u>1918167</u>	a	8	a	a	Non-Substantive Edit
simazine (Princep)	<u>122349</u>	a	a	a	4	Non-Substantive Edit
2,4,5-T	<u>93765</u>	a	a	a	a	Non-Substantive Edit
tributyltin (TBT) oxide	<u>56359</u>	0.149 0.46	0.026 0.072	a	a	Approve. The KDHE adopted the EPA's 304(a) recommendation.
toxaphene	<u>8001352</u>	0.73	0.0002	0.00028	b 0.00073 ^b	Non-Substantive Edit
2,4,5-TP (Silvex)	<u>93721</u>	a	a	a	10 50	Approve. The KDHE adopted a WQC more stringent than the EPA's 304(a) recommendation.

a - Criterion not available

b - US EPA has promulgated this criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36. ~~KDHE has not adopted the criterion into the Kansas Surface Water Quality Standards. Nevertheless, the criterion is still applicable to Kansas.~~

c - Criterion under investigation

d - The Biotic Ligand Model (BLM) can be found in the "Aquatic Life Ambient Freshwater Quality Criteria-Copper 2007 Revision (EPA-822-R-07-001, February 2007)", which is incorporated by reference.

Table 2 – Non-Substantive Changes Crosswalk

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28b		Definitions	
28-16-28b(e)		Background concentration	non-substantive wording changes; updated cross-references
28-16-28b(m)		Classified surface water	updated cross-references
28-16-28b(n)		Compliance Schedule	non-substantive wording changes; updated cross-references
28-16-28b(o)		Condition of acute toxicity	non-substantive wording changes
28-16-28b(p)		Condition of chronic toxicity	non-substantive wording changes
28-16-28b(q)		Criterion	non-substantive wording changes; updated cross-references
28-16-28b(r)		Critical low flow	non-substantive wording changes; updated cross-references
28-16-28b(v)	28-16-28b(u)	Discharge	
28-16-28b(y)	28-16-28b(v)	Ecological integrity	
28-16-28b(z)	28-16-28b(w)	Effluent	updated cross-references
28-16-28b(bb)	28-16-28b(x)	Escherichia coli	
28-16-28b(cc)	28-16-28b(y)	Exceptional state waters	updated cross-references
28-16-28b(ee)	28-16-28b(z)	Existing use	updated cross-references
28-16-28b(ff)	28-16-28b(bb)	Federal Clean Water Act	Date cited is inconsistent with promulgation and amendment dates
28-16-28b(hh)	28-16-28b(cc)	General purpose waters	
28-16-28b(ii)	28-16-28b(dd)	Groundwater	
28-16-28b(jj)	28-16-28b(ee)	Inhibition concentration 25	non-substantive wording changes
28-16-28b(kk)	28-16-28b(ff)	Kansas antidegradation policy	non-substantive wording changes
28-16-28b(ll)	28-16-28b(gg)	Kansas implementation procedures	non-substantive wording and date changes
28-16-28b(mm)	28-16-28b(hh)	Maximum contaminant level	non-substantive wording changes; update cross-references and dates
28-16-28b(nn)	28-16-28b(hh)	Median lethal concentration	
28-16-28b(oo)	28-16-28b(jj)	Microfibers per liter	non-substantive wording changes

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28b(pp)	28-16-28b(kk)	Microgram per liter	non-substantive wording changes
28-16-28b(qq)	28-16-28b(ll)	Milligram per liter	non-substantive wording changes
28-16-28b(rr)	28-16-28b(mm)	Mixing zone	updated cross-references
28-16-28b(ss)	28-16-28b(nn)	Mutagenic	
28-16-28b(tt)	28-16-28b(oo)	Nonpoint source	
28-16-28b(vv)	28-16-28b(pp)	Outstanding national resource water	updated cross-references
28-16-28b(ww)	28-16-28b(qq)	pH	
28-16-28b(xx)	28-16-28b(rr)	Picocurie per liter	non-substantive wording changes
28-16-28b(zz)	28-16-28b(tt)	Pollutant	non-substantive wording changes
28-16-28b(aaa)	28-16-28b(vv)	Potable Water	
28-16-28b(bbb)	28-16-28b(ww)	Precipitation runoff	
28-16-28b(ccc)	28-16-28b(xx)	Presedimentation sludge	non-substantive wording changes
28-16-28b(ddd)	28-16-28b(yy)	Private surface water	
28-16-28b(eee)	28-16-28b(zz)	Public swimming area	
28-16-28b(fff)	28-16-28b(aaa)	Seven-day, ten-year flow	non-substantive wording changes
28-16-28b(ggg)	28-16-28b(bbb)	Site-specific criterion	
28-16-28b(hhh)	28-16-28b(ccc)	Streamflow	non-substantive wording changes
28-16-28b(jjj)	28-16-28b(ddd)	Surface water register	non-substantive wording changes; update cross-references
28-16-28b(kkk)	28-16-28b(eee)	Surface water segment	
28-16-28b(mmm)	28-16-28b(ggg)	Surface waters of the state	
28-16-28b(nnn)	28-16-28b(hhh)	Teratogenic	
28-16-28b(ppp)	28-16-28b(iii)	Toxic substance	
28-16-28b(qqq)	28-16-28b(jjj)	Turbidity	
28-16-28b(rrr)	28-16-28b(kkk)	Use attainability analysis	update cross-references
28-16-28b(sss)	28-16-28b(lll)	Variance	non-substantive wording changes; update cross-references and dates
28-16-28b(ttt)	28-16-28b(mmm)	Water-effect ratio	non-substantive wording changes; update cross-references
28-16-28b(uuu)	28-16-28b(nnn)	Water quality certification	
28-16-28b(vvv)	28-16-28b(ooo)	Whole-effluent toxicity limitation	

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28b(www)	28-16-28b(ppp)	Zone of initial dilution	
28-16-28c		General Provisions	
28-16-28c(a)(1)(B)		Antidegradation – General purpose waters	non-substantive wording changes; updated cross-references
28-16-28c(a)(2)		Antidegradation – Exceptional state waters	non-substantive wording changes
28-16-28c(a)(3)		Antidegradation – Outstanding national resource waters	non-substantive wording changes
28-16-28c(a)(4)		Antidegradation – Threatened or endangered species	non-substantive wording changes; update cross-references and dates
28-16-28c(a)(5)		Antidegradation – Temporary discharges	non-substantive wording changes; updated cross-references
28-16-28c(a)(6)		Antidegradation – Thermal discharge	non-substantive wording changes; updated dates
28-16-28c(a)(7)		Antidegradation – Implementation	non-substantive wording changes
28-16-28c(b)(1)		Mixing zones – General limits	non-substantive wording changes; updated cross-references
28-16-28c(b)(3)		Mixing zones – Effluent-dominated streams	non-substantive wording changes
28-16-28c(b)(4)		Mixing zones – Applications	non-substantive wording changes; updated cross-references
28-16-28c(b)(6)		Mixing zones – Outstanding national resource waters	non-substantive wording changes; updated cross-references
28-16-28c(b)(8)(D)		Mixing zones – Recreational Uses	non-substantive wording changes
28-16-28c(b)(9)		Mixing zones – Alternate low flows	non-substantive wording changes
28-16-28c(b)(10)		Mixing zones – Alternate or site-specific mixing zones	non-substantive wording changes
28-16-28c(b)(11)		Mixing zones – Discharges into classified lakes	
28-16-28c(b)(12)		Mixing zones – Discharges into classified ponds	non-substantive wording changes
28-16-28c(b)(13)		Mixing zones – Discharges into classified wetlands	non-substantive wording changes; updated cross-references

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28c(c)		Special conditions	non-substantive wording changes; updated cross-references
28-16-28c(c)(1)		Special conditions – low flow	updated cross-references
28-16-28c(c)(2)	28-16-28c(c)(3)	Effluent-created flow	
28-16-28c(c)(2)(A)	28-16-28c(c)(3)(A)	Effluent-created flow – treatment in accordance with secondary treatment standards	non-substantive wording changes; updated cross-reference and dates
28-16-28c(c)(2)(B)	28-16-28c(c)(3)(B)	Effluent-created flow – discharge shall not violate general surface water quality criteria or impair existing/attained designated uses of downstream classified stream segments	non-substantive wording changes; updated cross-reference
28-16-28c(c)(2)(C)	28-16-28c(c)(3)(C)	Effluent-created flow – if UAA demonstrates designated uses of surface water segment are not attainable, new use designations for effluent-created flow shall be adopted and approved by EPA before serving as basis for permit	non-substantive wording changes; updated cross-reference
28-16-28c(d)(1)		Treatment requirements – minimum level of treatment	non-substantive wording changes; updated dates
28-16-28c(e)		Analytical testing – prescribed by the department.	non-substantive wording changes; updated cross-reference
28-16-28d		Surface water classification and use designation	
28-16-28d(a)(1)		Surface water classification – classified stream segments defined KSA 82a-2001	update cross-reference
28-16-28d(a)(2)(B)(iii)		Surface water classification – classified wetlands	non-substantive wording changes
28-16-28d(b)		Designated uses of classified surface waters other than classified stream segments	non-substantive wording changes; added title

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28d(b)(7)		Designated uses of classified surface waters other than classified stream segments – recreational use defined	non-substantive wording changes
28-16-28d(b)(7)(A)		Designated uses of classified surface waters other than classified stream segments – primary contact recreation use defined	non-substantive wording changes
28-16-28d(c)		Designated uses of classified stream segments	non-substantive wording changes; added title
28-16-28d(d)(1)		Assignment of uses surface waters – classified surface waters designation process, based on UAA	non-substantive wording changes; updated cross-reference
28-16-28d(d)(2)		Assignment of uses surface waters – Classified surface waters and designated uses shall be identified "Kansas surface water register"	non-substantive wording changes
28-16-28d(d)(3)		Assignment of uses surface waters – use designation for classified streams, lakes, wetlands, and ponds not on surface water register shall be determined on case-by-case basis	non-substantive wording changes
28-16-28e		Surface water quality criteria	
28-16-28e(a)		Criteria development guidance	non-substantive wording changes
28-16-28e(b)		General criteria for surface waters	non-substantive wording changes
28-16-28e(b)(2)		General criteria for surface waters – hazardous materials derived from artificial sources	non-substantive wording changes
28-16-28e(b)(9)		General criteria for surface waters - naturally occurring substances	non-substantive wording changes; updated cross-reference
28-16-28e(c)		Application of criteria for designated uses of surface waters	non-substantive wording changes
28-16-28e(c)(1)	formerly part of 28-16-28e(c)	Application of criteria for designated uses of surface waters – critical low flow less	non-substantive wording changes; new subsection

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
		than 0.03 cubic meters when water designated as expected aquatic life use waters and restricted aquatic life use waters	
28-16-28e(c)(2)	formerly part of 28-16-28e(c)	Application of criteria for designated uses of surface waters – critical low flow less than 0.03 cubic meters when water designated as special aquatic life use waters	non-substantive wording changes; new subsection
28-16-28e(d)	formerly part of 28-16-28e(c)	Criteria for designated uses of surface waters	new subsection; added title
28-16-28e(d)(1)	28-16-28e(c)(1)	Criteria for designated uses of surface waters – agricultural water supply use	non-substantive wording changes; updated cross-reverence
28-16-28e(d)(2)(A)-(D)	28-16-28e(c)(2)(A)-(D)	Criteria for designated uses of surface waters – aquatic life support use	non-substantive wording changes; updated cross-reverence
28-16-28e(d)(3)(A)-(D)	28-16-28e(c)(3)(A)-(D)	Criteria for designated uses of surface waters – domestic water supply use	non-substantive wording changes; updated cross-reverences and dates
28-16-28e(d)(4)(A)-(B)	28-16-28e(c)(4)(A)-(B)	Criteria for designated uses of surface waters – food procurement use	non-substantive wording changes; updated cross-reverences
28-16-28e(d)(5)	28-16-28e(c)(5)	Criteria for designated uses of surface waters – groundwater recharge use	
28-16-28e(d)(6)	28-16-28e(c)(6)	Criteria for designated uses of surface waters – industrial water supply use	
28-16-28e(d)(7)(A)-(F)	28-16-28e(c)(7)(A)-(F)	Criteria for designated uses of surface waters – recreational use	non-substantive wording changes; updated cross-reverences
28-16-28e(d)(8)	28-16-28e(c)(8)	Criteria for designated uses of surface waters – multiple uses	non-substantive wording changes; updated cross-reverences
28-16-28e(e)	28-16-28e(d)	Tables – numeric criteria	updated date
28-16-28f		Administration of surface Water quality standards	
28-16-28f(a)	28-16-28f(b)	Application of modified surface water quality standards	non-substantive wording changes

Current KAR #	Former KAR # (where applicable)	Title/Description (summary)	Comments Regarding Changes (other than renumbering)
28-16-28f(b)(1)-(4)	28-16-28f(c)	Water quality certification	non-substantive wording changes
28-16-28f(c)(1)-(2)	28-16-28f(d)	Compliance schedules compliance schedules	updated cross-references
28-16-28f(f)	28-16-28f(g)	Enforcement	
28-16-58		Definitions	Not WQS
28-16-58(a)(8)		Kansas implementation procedures: wastewater permitting means procedures written/used by dept. for development of NPDES permit limitations	